

CLAIMS:

1. A process for the preparation of pharmaceutical grade white oils from a mineral hydrocarbon oil feedstock having a viscosity ranging from about 60 to about 600 SUS at 37.8°C, by a four stage catalytic process, which process comprises: (1) hydrotreating the mineral oil feedstock in a first reaction stage containing a hydrotreating catalyst and a hydrogen-containing treat gas under hydrotreating conditions, thereby resulting in a first stage reaction product which is at least partially hydrogenated and desulfurized; (2) hydrotreating the reaction product of the first reaction stage in a second reaction stage in the presence of: (i) a hydrodesulfurization catalyst comprised of a Group VIII metal on bound M41S support, (ii) a hydrogen containing treat gas, wherein the second reaction stage is operated at temperatures from about 150°C to 500°C and pressures from about 500 to 3,000 psig (3549 to 20,786 kPa); (3) treating hydrotreated product from stage 2 with a reduced metal hydrogen sulfide sorbent material in stage 3, and (4) hydrogenating the reaction product from reaction stage 3 in a fourth reaction stage in the presence of a Group VIII metal based catalyst, thereby producing a white oil.

2. The process of claim 1 wherein the Group VIII metal noble metal is at least one of Pt, Pd, and Ir.

3. The process of claim 2 wherein the noble metal is at least one of from Pt and Pd.

4. The process of claim 1 wherein the hydrogen sulfide sorbent material is at least one reduced non-noble Group VIII metal supported on a low acidity oxide.

5. The process of claim 1 wherein the hydrodesulfurization catalyst is promoted with at least one of Re, Cu, Ag, Au, Sn, Mn, and Zn.

6. The process of claim 1 wherein the concentration of noble metal is from about 0.01 to 3 wt.%, based on the total weight of the catalyst.

7. The process of claim 1 wherein the hydrotreating catalyst contains at least one of Co, Ni, and Cu.

8. The process of claim 1 wherein the hydrodesulfurization catalyst and the hydrogen sulfide sorbent material are composited into single particles.

9. The process of claim 1 wherein the pressure in the second reaction stage is from about 1,000 to 3,000 psig (6996 - 20,786 kPa).

10. The process of claim 1 wherein the initial feedstock is a solvent extracted lubricating oil having a viscosity ranging from about 70 to 600 SUS at 37.8°C.

11. The process of claim 1 wherein M41S is a family of mesoporous including MCM-41, MCM-48 and MCM-50.

12. The process of claim 11 wherein the mesoporous catalyst is MCM-41.

13. The process of claim 1 wherein the Group VIII metal based catalyst is Ni, Pd or Pt on a support.

14. The process of claim 13 wherein the metal based catalyst is Ni.